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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/558,645	04/26/2000	Alexander Kaplan	08935-170001/M-4860	9640

7590

05/01/2002

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EXAMINER

EDMONDSON, LYNNE RENEE

ART UNIT

PAPER NUMBER

1725

6

DATE MAILED: 05/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/558,645

Applicant(s)

KAPLAN ET AL.

Examiner

Lynne Edmondson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☒ Claim(s) 42 and 43 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>9</u> . | 6) <input type="checkbox"/> Other:  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

1. Claims 1-4, 7-11, 14-23 and 26-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Kordes et al. (USPN 3945847).

Kordes teaches an aqueous battery (col 1 lines 11-22) comprising a container (34 having an air port (38) , a cathode (28) coated on a collector (36) , a zinc anode (31) and separators (32,33) (figure 4, col 4 lines 25-49, col 5 lines 1-42 and col 9 lines 1-22). The battery may be any shape including but not limited to prismatic (flat) (col 1 lines 22-26), rectangular (col 4 lines 1-24) or cylindrical (col 9 lines 39-45). A flat rolled battery would be racetrack (oval) shaped. The cathode comprises up to 90% MnO<sub>2</sub> and 8%

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carbon with a binder material (col 5 lines 25-40) that may be 2.5-3.0 % polysulfone (col 11 lines 50-60) or up to 5% (col 18 lines 40-41). Polysulfone is a hydrophobic polymer. The composition may contain 70-80, 80 or 85% MnO<sub>2</sub> (col 8 lines 32-49). Any size battery can be formed including but not limited to AA (col 13 line 65), C and D (col 15 lines 30-51) size cells. The battery may also be rectangular with parallel elements forming a racetrack battery (figures 15 and 16). See also Kordesch claims 1-5, 9 and 13-17.

2. Claims 1-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Oh et al. (USPN 6187475 B1).

Oh teaches a rechargeable cathode for use in an aqueous cell containing at least 60% MnO<sub>2</sub>, up to 15% carbon and a hydrophobic, PTFE binder up to 15% (leaving a minimum of 70% MnO<sub>2</sub>) mixed together to form a paste to be disposed on a current collector (col 7 lines 1-52). Note that the anode is zinc (col 7 lines 53-61). In example one, the mixture comprises 80% MnO<sub>2</sub>, 8% carbon and 2% PTFE (col 10 line 65 to col 11 line 21). These amounts may be adjusted depending on the physiochemical properties of the constituents, the shape of the electrodes and the desired electrode characteristics (col 10 lines 45-53).

3. Claim 39 is rejected under 35 U.S.C. 102(e) as being anticipated by Debe et al. (USPN 6183668 B1).

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Debe teaches a method of making a cathode by combining a catalyst, carbon particles and a solvent to form a mixture and adding a hydrophobic polymer (col 1 lines 40-65). Initial mixing takes place at 0 degrees (col 16 lines 43-55) followed by an additional mixing step at greater than 20 degrees (col 24 lines 62-67).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5, 6, 12, 13, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kordes et al. (USPN 3945874) in view of Tomiyama (USPN 5677083).

Kordes teaches an aqueous battery (col 1 lines 11-22) comprising a container (34 having an air port (38), a cathode (28) coated on a collector (36), a zinc anode (31) and separators (32,33) (figure 4, col 4 lines 25-49, col 5 lines 1-42 and col 9 lines 1-22). The battery may be any shape including but not limited to prismatic (flat) (col 1 lines 22-26), rectangular (col 4 lines 1-24) or cylindrical (col 9 lines 39-45). A flat rolled battery would be racetrack (oval) shaped. The cathode comprises up to 90% MnO<sub>2</sub> and 8% carbon with a binder material (col 5 lines 25-40) that may be 2.5-3.0 % polysulfone (col 11 lines 50-60) or up to 5% (col 18 lines 40-41). Polysulfone is a hydrophobic polymer. The composition may contain 70-80, 80 or 85% MnO<sub>2</sub> (col 8 lines 32-49). Any size

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battery can be formed including but not limited to AA (col 13 line 65), C and D (col 15 lines 30-51) size cells. The battery may also be rectangular with parallel elements forming a racetrack battery (figures 15 and 16). Although a higher binder content is disclosed (col 18 lines 15-30), there is no disclosure of at least 7% hydrophobic polymer. Neither is PTFE is disclosed.

Tomiyama teaches a cathode comprising MnO<sub>2</sub> (col 3 line 56), 1-50% carbon and 1-50% of a fluorinated polymer such as PTFE a known hydrophobic material (col 9 lines 13-50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ a high binder content (at least 7%) using only a single hydrophobic binder such as PTFE to prevent exfoliation and disintegration (Kordesch, col 18 lines 24-30).

5. Claims 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kordesch et al. (USPN 3945874) in view of Mishina et al. (USPN 5800939).

Kordesch teaches an aqueous battery (col 1 lines 11-22) comprising a container (34 having an air port (38), a cathode (28) coated on a collector (36), a zinc anode (31) and separators (32,33) (figure 4, col 4 lines 25-49, col 5 lines 1-42 and col 9 lines 1-22). The battery may be any shape including but not limited to prismatic (flat) (col 1 lines 22-26), rectangular (col 4 lines 1-24) or cylindrical (col 9 lines 39-45). A flat rolled battery would be racetrack (oval) shaped. The cathode comprises up to 90% MnO<sub>2</sub> and 8% carbon with a binder material (col 5 lines 25-40) that may be 2.5-3.0 % polysulfone (col

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11 lines 50-60) or up to 5% (col 18 lines 40-41). Polysulfone is a hydrophobic polymer. The composition may contain 70-80, 80 or 85% MnO<sub>2</sub> (col 8 lines 32-49). Any size battery can be formed including but not limited to AA (col 13 line 65), C and D (col 15 lines 30-51) size cells. The battery may also be rectangular with parallel elements forming a racetrack battery (figures 15 and 16). Although battery sealing is well known in the art, there is no disclosure of a sealing step.

Mishina teaches a sealed battery which has a prismatic (flat) or cylindrical configuration (col 29 lines 44-55). The cathode is a mixture of MnO<sub>2</sub>, carbon and a binder (col 29 lines 1-16).

It would have been obvious to one of ordinary skill in the art at the time of the invention to seal the assembled commercial cells (Kordesch, col 13 line 8 and col 14 line 15) as is known in the art for improved performance, improved stability and more efficient electrochemical utilization (Kordesch, col 2 lines 1-12).

6. Claims 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Debe et al. (USPN 6183668) in view of Buchta (USPN 4582553).

Debe teaches a method of making a cathode by combining a catalyst, carbon particles and a solvent to form a mixture and adding a hydrophobic polymer (col 1 lines 40-65). Initial mixing takes place at 0 degrees (col 16 lines 43-55) followed by an additional mixing step at greater than 20 degrees (col 24 lines 62-67). However, there is no disclosure of vacuum mixing.

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Buchta teaches vacuum mixing of cathode materials which takes place at elevated temperatures (col 19 lines 3-9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ vacuum mixing at elevated temperatures to decrease paste viscosity and remove trapped air from the mixture (Debe, col 12 lines 58-67 and col 24 lines 62-67).

### ***Response to Arguments***

7. Regarding applicant's argument that Kordesch does not teach an air access port, this port (38) is shown in figures 15 and 16 extending out of the container (col 4 lines 43-54). Therefore the 102 rejection of claims 15-17, 19-23, 26-29, 31 and 33 as anticipated by Kordesch stands and now includes claims 1-4, 7-11, 14, 18, 30 and 32 and the 103 rejection of claims 24 and 25 as obvious over Kordesh in view of Tomiyama stands and now includes claims 5, 6, 12 and 13. The 103 rejection of claims 34-38 as obvious over Kordesh in view of Mishina.

8. Regarding applicants argument that the Debe reference does not teach initial mixing below about 10 C, Debe teaches initial mixing between 0 and 20 C which puts the claimed upper limit directly in the middle of the range with half of the range falling within the claim limitations particularly since the term "about" is being used. Therefore



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the 102 rejection of claim 39 as anticipated by Debe stands and the 103 rejection of claims 40 and 41 as obvious over Debe in view of Buchta.

### ***Allowable Subject Matter***

9. Claims 42 and 43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The closest prior art teaches the method of making the paste essentially as claim, however conventional processes employ much higher stirring rates (Brodd et al. USPN 6156458).

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Getz et al. (USPN 5464709, hydrophobic binder, >60% MnO<sub>2</sub>), Thiebolt, II et al. (USPN 6174622 B1, PTFE, >60% MnO<sub>2</sub>), Kawakami et al. (USPN 6239096 B2, sealed), Tomantschger et al. (USPN 5300371), Davis et al. (USPN 6333123 B1), Urry (USPN 4032696), Hilarius et al. (USPN 6337160), and Hull et al. (USPN 6265104 B1, all sizes made by same process).

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne Edmondson whose telephone number is (703) 306-5699. The examiner can normally be reached on M-F from 7-4 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7118 for regular communications and (703) 305-7115 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

Lynne Edmondson  
Examiner  
Art Unit 1725

LRE  
April 29, 2002

  
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